



SDMS DocID 583384

ARCS**Revised Site Inspection Prioritization Worksheets****Truk-Away Landfill****Warwick, Rhode Island**

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY, Region I
Waste Management Division
Boston, MA

Work Assignment No.: 023-1JZZ
EPA Region: I
CERCLIS No.: RID987493822
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Date Prepared: December 10, 1993

SITE INSPECTION WORKSHEETS

CERCLIS IDENTIFICATION NUMBER

RID987493822

Document Control Number 7710-023-DD-BGMN

SITE LOCATION			
SITE NAME: LEGAL, COMMON, OR DESCRIPTIVE NAME OF SITE Truk-Away Landfill			
STREET ADDRESS, ROUTE, OR SPECIFIC LOCATION IDENTIFIER Industrial Drive			
CITY Warwick	STATE RI	ZIP CODE 02888	TELEPHONE ()
COORDINATES: LATITUDE and LONGITUDE 41° 34' .50" N, 71° 25' 20" W		TOWNSHIP, RANGE, AND SECTION /	

OWNER/OPERATOR IDENTIFICATION					
OWNER RI Department of Transportation, Division of Airports			OPERATOR (former owner and operator) Charles Wilson, Truk-Away of RI, Inc.		
OWNER ADDRESS T.F. Green State Airport			OPERATOR ADDRESS 65 O'Keefe Lane		
CITY Warwick			CITY Warwick		
STATE RI	ZIP CODE 02886	TELEPHONE (401) 737-4000	STATE RI	ZIP CODE 02888	TELEPHONE (401) 941-7900

SITE EVALUATION		
AGENCY/ORGANIZATION CDM Federal Programs Corporation		
INVESTIGATOR Tara Abbott Taft		
CONTACT Tara Abbott Taft		
ADDRESS 98 North Washington Street		
CITY Boston	STATE MA	ZIP CODE 02114
TELEPHONE (617) 742-2659		

December 10, 1993

GENERAL INFORMATION

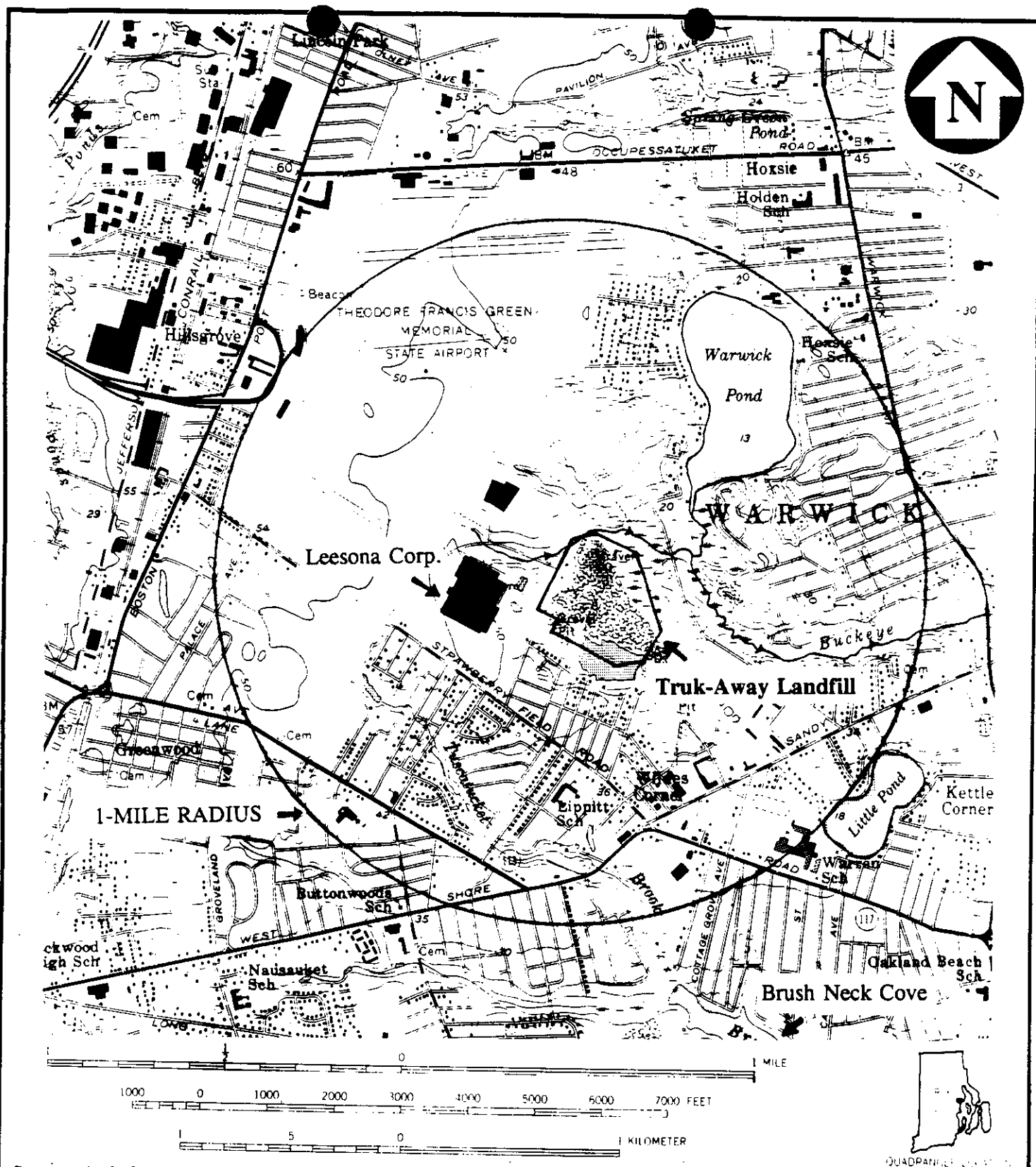
Site Description and Operational History: Provide a brief description of the site and its operational history. State the site name, owner, operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note whether these activities are documented or alleged. Identify all source types and prior spills, floods, or fires. Summarize highlights of the PA and other investigations. Cite references.

The Truk-Away Landfill began accepting municipal and industrial wastes in 1970 under the name Warwick Sanitary Landfill, owned and operated by Sanitas Waste Disposal of Rhode Island, a private commercial refuse collection company [4]. By 1976, the company had changed its name to Truk-Away of Rhode Island, Inc. The Rhode Island Department of Transportation (DOT) Division of Airports reportedly condemned and closed the landfill in 1977 because birds circling the landfill interfered with air traffic at the nearby T.F. Green State Airport [2,7]. The landfill stopped operating, and the DOT took ownership on October 25, 1977 [4].

In 1982, a former Truk-Away Landfill employee told the Rhode Island Department of Environmental Management (RIDEM) that during the 1970s, he had been responsible for overseeing disposal at the landfill of hundreds of drums containing chemical wastes (including sulfur monochloride, benzyl chloride, xylol, toluene, pyridine, spent solvents, nitrobenzene, chlorobenzene, trichloroethylene (TCE), dyes, pigments, intermediate compounds made from benzene reactions, phenols, hydrogen peroxide, and benzene sulfonyl chloride) [8].

Truk-Away Landfill was entered into CERCLIS in 1981. In April 1982, an EPA contractor, Ecology and Environment, Inc., conducted a Preliminary Assessment of the landfill and in June 1982, conducted organic vapor sampling at the landfill as part of a Site Inspection. Tetrachloroethylene (PCE) (at 2 parts per million (ppm)) and toluene (at 2 ppm) were detected in leachate samples [5,9]. No further sampling was conducted until 1987, when RIDEM sampled an unnamed pond bordering the landfill in response to public complaints. Analytical results indicated the presence of polychlorinated biphenyls (PCBs) (at 3 ppm) in surface water, and chloroethane (at 17 parts per billion (ppb)), methylene chloride (at 5 ppb), and TCE (at 1 ppb) in sediment samples [14].

Although the landfill has not been active since 1977, illegal dumping has continued to be a problem. The landfill was reportedly being used to illegally dispose of solid waste in December 1990 [1]. The Division of Airports installed Jersey barriers in front of the landfill's front gate to prevent trucks from ramming the locked fence. During CDM's reconnaissance, an approximate 25-foot fence opening was noted at the landfill's southern boundary. Well worn trails indicated recreational dirt biking from a nearby residential area onto the property [3]. CDM's 1993 sampling event indicated the presence of several contaminants in surface soil on the landfill including toluene, PCBs, arsenic, chromium, lead, mercury, and several semivolatile compounds. In addition, analytical results of sediment samples collected from Buckeye Brook indicated the presence of bis(2-ethylhexyl)phthalate, pyrene, 4,4'-DDE, PCB (aroclor-1260), arsenic, lead, and mercury [3,27,28].



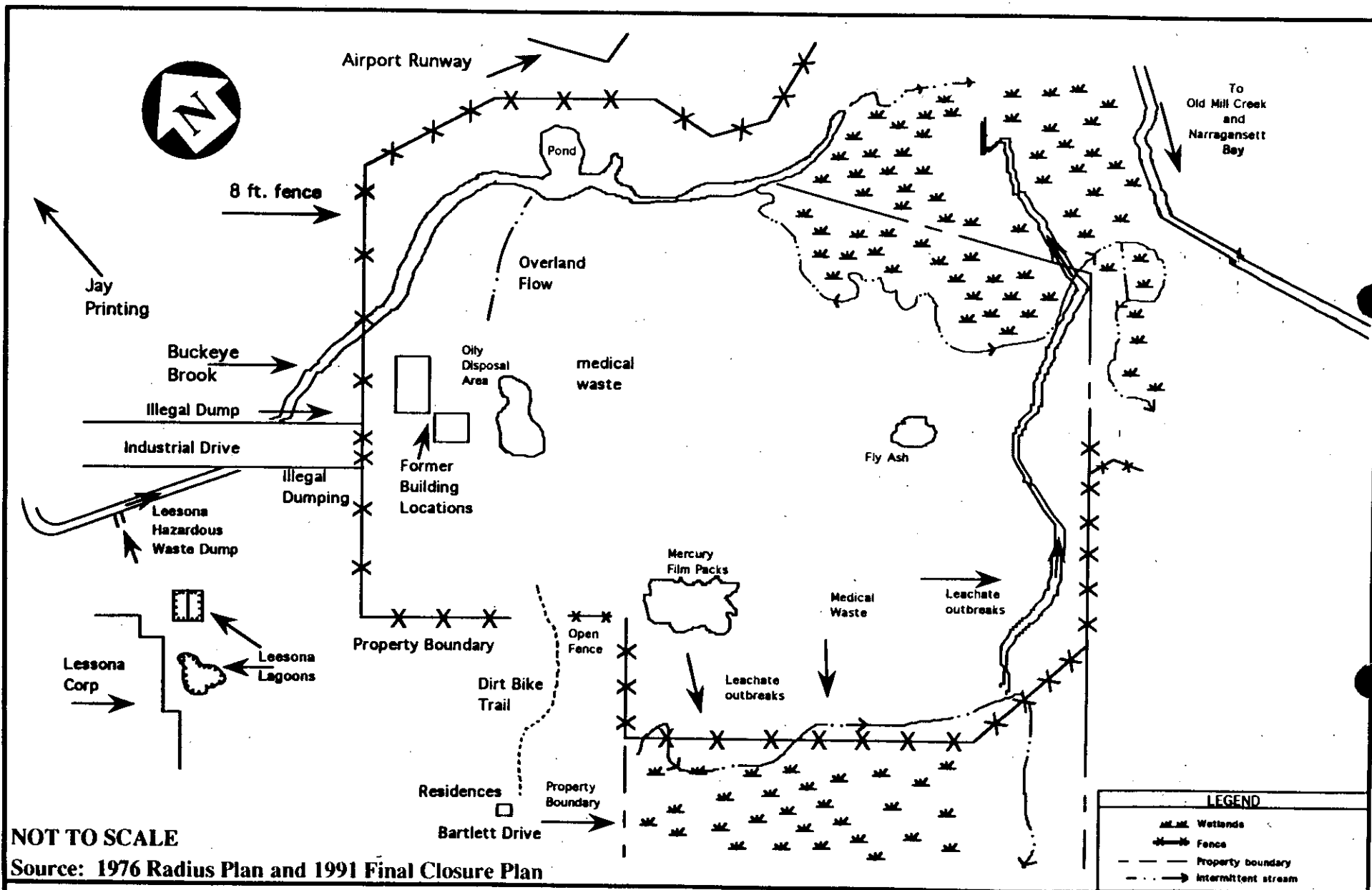
Source: U.S.G.S. 1957. East Greenwich, R.I. 7.5' series (topographic).

LOCATION MAP **TRUK-AWAY LANDFILL** **WARWICK, RHODE ISLAND**



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Figure 1



SITE SKETCH **TRUK-AWAY LANDFILL** **WARWICK, RI**

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Figure 2

GENERAL INFORMATION (continued)

Source Description: Include description of containment per pathway for ground water (see HRS Table 3-2), surface water (see HRS Table 4-2), and air (see HRS Tables 6-3 and 6-9).

Truk-Away Landfill property is approximately 52 acres in size; subtracting the existing wetlands areas, the landfill is approximately 36 acres in size [3,10]. The unlined landfill has not been officially closed. Many areas are exposed although a cover of 3 feet was added daily during the landfill's operation and up to 8 feet of fill has been added to specific areas of the landfill to cover medical waste. During the 1993 site reconnaissance, exposed trash, crushed drums, fly ash, medical waste, slag glass, electrical waste, mercury film packs, and lead batteries were observed throughout the site [3]. Based on the above conditions, the containment of hazardous substances in the landfill has been identified as 10 for each of the migration pathways.

Hazardous Waste Quantity (HWQ) Calculation: SI Tables 1 and 2 (See HRS Tables 2-5, 2-6, and 5-2).

Hazardous waste quantity for the landfill was calculated using the entire landfill as a single source since the amount of hazardous waste disposed of at the landfill is not known [3,10].

36 acres

$$= 1,568,160 \text{ ft}^2$$

Area for landfill > 340,000 to 34 million ft^2
HWQ = 100

Attach additional pages, if necessary

HWQ = 100

SI Table 3: WASTE CHARACTERIZATION WORKSHEETS

Truk-Away Landfill

Warwick, RI

CERCLIS ID Number: RID987493822

SCDM Version: March 1993

Sources:

1. Landfill

References: 5,8,9,14,31

Note: This table includes contaminants detected at 3x the reference sample or greater than the reference sample's SQL or SDL.

S o u r c e	Hazardous Substance	Toxicity	GROUND WATER PATHWAY		SURFACE WATER PATHWAY								GROUND WATER TO SURFACE WATER				f s
			GW Mobility (HRS Table 3-8)	Tox./ Mobility Value (HRS Table 3-9)	OVERLAND/FLOOD MIGRATION								Tox./Mob./ Pers. Value (HRS Table 4-26)	Tox./Mob./ Pers./Bioacc. Value (HRS Table 4-28)	Ecotox./ Mob./Pers./ Value (HRS Table 4-29)	Ecotox./ Mob./Pers./ Env. Bioacc. Value(HRS Table 4-30)	
					Pers. (HRS Tables 4-10 & 4-11)	Tox./Pers. Value (HRS Table 4-12)	Bioacc. Pot. (HRS Table 4-15)	Tox./Pers./ Bioacc. Value (HRS Table 4-16)	Ecotox. (HRS Table 4-19)	Ecotox./ Pers. (HRS Table 4-20)	Env. Bioacc. Pot. (HRS Table 4-15)	Ecotox./Pers./ Env. Bioacc. Value (HRS Table 4-21)					
1	Arsenic	10000	0.01	100	1	10000	500	5.00E+06	10	10	50	500	100	50000	0.1	5	27
1	Benz(a)anthracene	1000	0.0001	1	1	1000	50000	5.00E+07	10000	10000	50000	5.00E+08	1	50000	10	5.00E+05	28
1	Benzo(j,k)fluorene	100	0.0001	0.01	1	100	5000	5.00E+06	10000	10000	5000	5.00E+07	0.1	50	1	5000	28
1	Bis(2-ethylhexyl)phthalate	100	0.0001	0.01	1	100	500	50000	1000	1000	50000	5.00E+07	0.01	5	0.1	5000	28
1	Chlorobenzene	100	0.01	1	0.0007	0.07	50	3.5	1000	0.7	50	35	0.0007	0.035	0.007	0.35	28
1	Chloroethane	1	1	1	0.0007	0.0007	5	0.0035	NA	NA	5	NA	0.0007	0.0035	NA	NA	28
1	Chromium (total)	10000	0.01	100	1	10000	500	5.00E+06	10000	10000	5	50000	100	50000	10000	50000	27
1	Copper	NA	0.01	NA	1	NA	50000	NA	100	100	50000	5.00E+06	NA	NA	1	50000	27
1	4,4'-DDE	100	0.0001	0.01	1	100	50000	5.00E+06	10000	10000	50000	5.00E+08	0.01	500	5.00E+06	5.0E+10	28
1	1,1-Dichloroethane	10	1		0.4	4	5	20	NA	NA	5	NA	NA	NA	NA	NA	28
1	Indeno(1,2,3-cd)pyrene	NA	0.0001	NA	1	NA	50000	NA	NA	NA	50000	NA	NA	NA	NA	NA	27
1	Iron	NA	0.01	NA	1	NA	0.5	NA	10	10	0.5	5	NA	NA	0.1	0.05	28
1	Lead	10000	0.01	100	1	10000	5000	5.00E+07	1000	1000	5000	5.00E+06	100	5.00E+05	10	50000	27
1	Mercury	10000	1	10000	1	10000	50000	5.00E+08	10000	10000	50000	5.00E+08	10000	5.00E+08	10000	5.0E+08	27
1	Methylene Chloride	10	1	10	0.4	4	5	20	1	0.4	5	2	4	20	0.4	2	28
1	o-Xylene	1	0.01	0.01	0.4	0.4	50	20	100	40	50	2000	0.004	0.2	0.4	20	28
1	PCBs	10000	0.0001	1	1	10000	50000	5.00E+08	10000	10000	50000	5.00E+08	1	50000	1	50000	28
1	Phenol	1	1	1	1	1	5	5	10000	10000	5	50000	1	5	10000	50000	28
1	Pyrene	100	0.0001	0.01	1	100	50	5000	NA	NA	50	NA	0.01	0.5	NA	NA	28
1	Tetrachloroethene	100	0.01	1	0.4	40	50	2000	100	40	50	2000	0.4	20	0.4	20	28
1	Toluene	10	0.01	0.1	0.4	4	50	200	100	40	50	2000	0.04	2	0.4	20	28
1	Trichloroethylene	10	0.01	0.1	0.4	4	50	200	100	40	50	2000	0.04	2	0.4	20	28

Note: NA = Not Available in current version of SCDM. Human food chain bioaccumulation numbers reflect salt water values; sensitive environment bioaccumulation and toxicity numbers reflect fresh water values.

Benzo(j,k)fluorene = 1000

SI TABLE 4: GROUND WATER OBSERVED RELEASE SUBSTANCES (BY AQUIFER)

Sample ID	Hazardous Substance	Bckgrd. Conc.	Toxicity/Mobility	References
Highest Toxicity/Mobility				

SI TABLE 5: GROUND WATER ACTUAL CONTAMINATION TARGETS

Well ID: _____ Level I _____ Level II _____ Population Served _____ References _____

Sample ID	Hazardous Substance	Conc. (µg/L)	Benchmark Conc. (MCL or MCLG)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
Highest Percent					Sum of Percents		Sum of Percents	

Well ID: _____ Level I _____ Level II _____ Population Served _____ References _____

Sample ID	Hazardous Substance	Conc. (µg/L)	Benchmark Conc. (MCL or MCLG)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
Highest Percent					Sum of Percents		Sum of Percents	

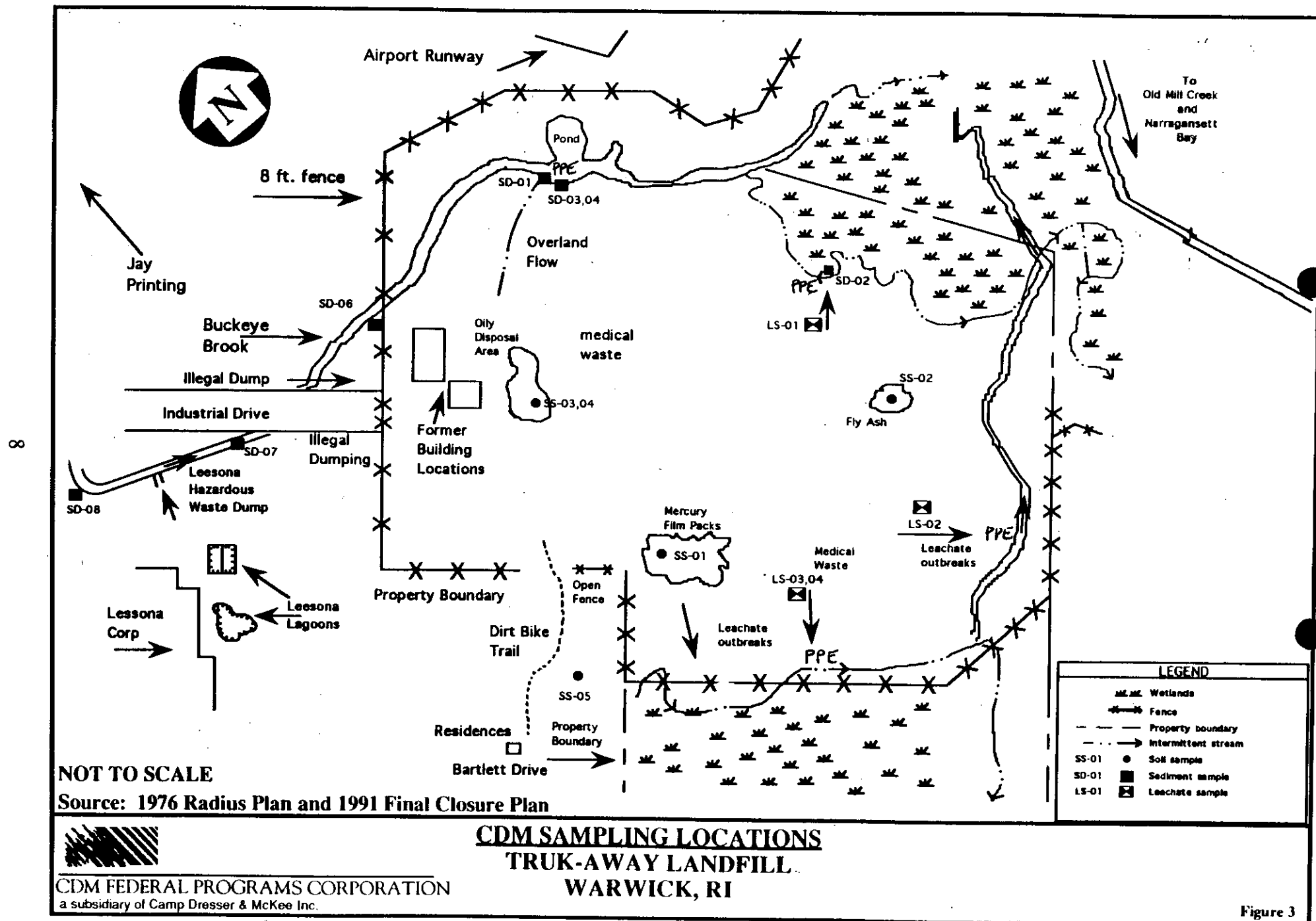


Figure 3

GROUND WATER PATHWAY GROUND WATER USE DESCRIPTION

Describe Ground Water Use within 4 Miles of the Site:
Describe generalized stratigraphy, aquifers, municipal and private wells

(see attached)

Show Calculations of Ground Water Drinking Water Populations for each Aquifer:

Provide apportionment calculations for blended supply systems.

County average number of persons per household: 2.52 Reference 25

2.25 miles from site: 1 well x 2.52 persons/household = 2.52

2.3 miles from site: 5 wells x 2.52 persons/household = 12.6

3.5 miles from site: 5 wells x 2.52 persons/household = 12.6

27.72

Note: Well calculations are based only on information provided by R. Susi of the Warwick Water Department [23].

Groundwater Use Description

Surficial geology in the area is made up of outwash, medium to coarse grained sand and gravel interbedded with fine sand, silt, and clay; unconsolidated; generally well sorted and stratified. Bedrock at the landfill is made up of consolidated igneous, metamorphic, and sedimentary rocks and is found approximately 70 feet below the surface [13,29]. Depth of groundwater ranges from 3 to 17 feet according to seven test pits located at the site in 1976 [15]. Drainage is in an easterly direction toward Buckeye Brook [13,28].

Groundwater beneath the site is classified by RIDEM as GB: groundwater sources which may not be suitable for public or private drinking water without treatment due to known or presumed degradation. The site is located approximately 1.25 miles west (upgradient) of groundwater classified as GA: groundwater sources which may be suitable for public or private drinking water sources [14]. There are no community drinking water wells and no wellhead protection areas located within 4 miles of the site. The Warwick Water Department supplies 26,000 active services (households) in Warwick with drinking water from the Scituate Reservoir. Kent County Water Authority supplies 24,000 service connections in Warwick with drinking water from the Scituate Reservoir and from groundwater. Kent County's drinking water supply wells are located in Coventry and East Greenwich [20,22,23]. The nearest public drinking water well owned by the Kent County Water Authority well is located approximately 6 miles south of the site on the border of East Greenwich and North Kingston at the Hope River [20].

There are no records of private drinking water wells for the Warwick area. The Warwick Water Department indicated possible locations where groundwater may be used for drinking water. These areas include one residence on Payton Avenue (located approximately 2.25 miles east and downgradient of the site), a private compound including five potential drinking water wells located on Budlong Road (located approximately 2.3 miles northwest (upgradient) of the site), and five residences or businesses (not documented) located on Bald Hill Road (located approximately 3.5 miles west (upgradient) of the site) [23]. The average number of persons per household in Warwick is 2.52 [25].

GROUND WATER PATHWAY WORKSHEET

LIKELIHOOD OF RELEASE	Score	Data Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to the aquifer, assign a score of 550. Record observed release substances on SI Table 4.			
2. POTENTIAL TO RELEASE: Depth to aquifer: <u>3</u> feet. If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Optionally, evaluate potential to release according to HRS Section 3.	500	E	15
LR =		500	

TARGETS

<p>Are any wells part of a blended system? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>If yes, attach a page to show apportionment calculations.</p>			
<p>3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates that any target drinking water well for the aquifer has been exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5).</p> <p>Level I: _____ people x 10 = _____</p> <p>Level II: _____ people x 1 = _____ Total = _____</p>	0	H	20, 22, 23
<p>4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the site; record the population for each distance category in SI Table 6a or 6b. Sum the population values and multiply by 0.1.</p>	0.3	E	20, 22, 23
<p>5. NEAREST WELL: Assign a score of 50 for any Level I Actual Contamination Targets for the aquifer or overlying aquifer. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Targets exist, assign the Nearest Well score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles, assign 0.</p>	3	E	20, 22, 23
<p>6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA for the aquifer, or if a ground water observed release has occurred within a WHPA, assign a score of 20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign 0.</p>	0	H	12
<p>7. RESOURCES: Assign a score of 5 if one or more ground water resource applies; assign 0 if none applies.</p> <ul style="list-style-type: none"> • Irrigation (5 acre minimum) of commercial food crops or commercial forage crops • Watering of commercial livestock • Ingredient in commercial food preparation • Supply for commercial aquaculture • Supply for a major or designated water recreation area, excluding drinking water use 	0	H	23
Sum of Targets T=		3.3	

SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS

SI Table 6a: Other Than Karst Aquifers

Distance from Site	Pop.	Nearest Well (choose highest)	Population Served by Wells within Distance Category												Pop. Value	Ref.
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,000 to 3,000,000		
0 to $\frac{1}{4}$ mile	—	20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455	0	23
$\frac{1}{4}$ to $\frac{1}{2}$ mile	—	18	2	11	33	102	324	1,013	3,233	10,122	32,325	101,213	323,243	1,012,122	0	23
$\frac{1}{2}$ to 1 mile	—	9	1	5	17	52	167	523	1,669	5,224	16,684	52,239	166,835	522,385	0	23
> 1 to 2 miles	—	5	0.7	3	10	30	94	294	939	2,939	9,385	29,384	93,845	293,842	0	23
> 2 to 3 miles	15	③	0.5	②	7	21	68	212	678	2,122	6,778	21,222	67,777	212,219	2	23
> 3 to 4 miles	13	2	0.3	①	4	13	42	131	417	1,306	4,171	13,060	41,709	130,596	1	23

Nearest Well = 3

Sum = 3

GROUND WATER PATHWAY WORKSHEET (concluded)

WASTE CHARACTERISTICS	Score	Data Type	Does not Apply																						
8. If any Actual Contamination Targets exist for the aquifer or overlying aquifers, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to ground water.	100	H																							
9. Assign the highest ground water toxicity/mobility value from SI Table 3 or 4. Mercury = 10,000	10,000	H	27, 28, 31																						
10. Multiply the ground water toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: (from HRS Table 2-7)																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Product</th> <th style="text-align: center;">WC Score</th> </tr> </thead> <tbody> <tr><td>0</td><td style="text-align: center;">0</td></tr> <tr><td>>0 to <10</td><td style="text-align: center;">1</td></tr> <tr><td>10 to <100</td><td style="text-align: center;">2</td></tr> <tr><td>100 to <1,000</td><td style="text-align: center;">3</td></tr> <tr><td>1,000 to <10,000</td><td style="text-align: center;">6</td></tr> <tr><td>10,000 to <1E + 05</td><td style="text-align: center;">10</td></tr> <tr><td>1E + 05 to <1E + 06</td><td style="text-align: center;">18</td></tr> <tr><td>1E + 06 to <1E + 07</td><td style="text-align: center;">32</td></tr> <tr><td>1E + 07 to <1E + 08</td><td style="text-align: center;">56</td></tr> <tr><td>1E + 08 or greater</td><td style="text-align: center;">100</td></tr> </tbody> </table>				Product	WC Score	0	0	>0 to <10	1	10 to <100	2	100 to <1,000	3	1,000 to <10,000	6	10,000 to <1E + 05	10	1E + 05 to <1E + 06	18	1E + 06 to <1E + 07	32	1E + 07 to <1E + 08	56	1E + 08 or greater	100
Product	WC Score																								
0	0																								
>0 to <10	1																								
10 to <100	2																								
100 to <1,000	3																								
1,000 to <10,000	6																								
10,000 to <1E + 05	10																								
1E + 05 to <1E + 06	18																								
1E + 06 to <1E + 07	32																								
1E + 07 to <1E + 08	56																								
1E + 08 or greater	100																								
	32																								
	WC = 32																								

Multiply LR by T and by WC. Divide the product by 82,500 to obtain the ground water pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

GROUND WATER PATHWAY SCORE:

$$\frac{LR \times T \times WC}{82,500}$$

0.64

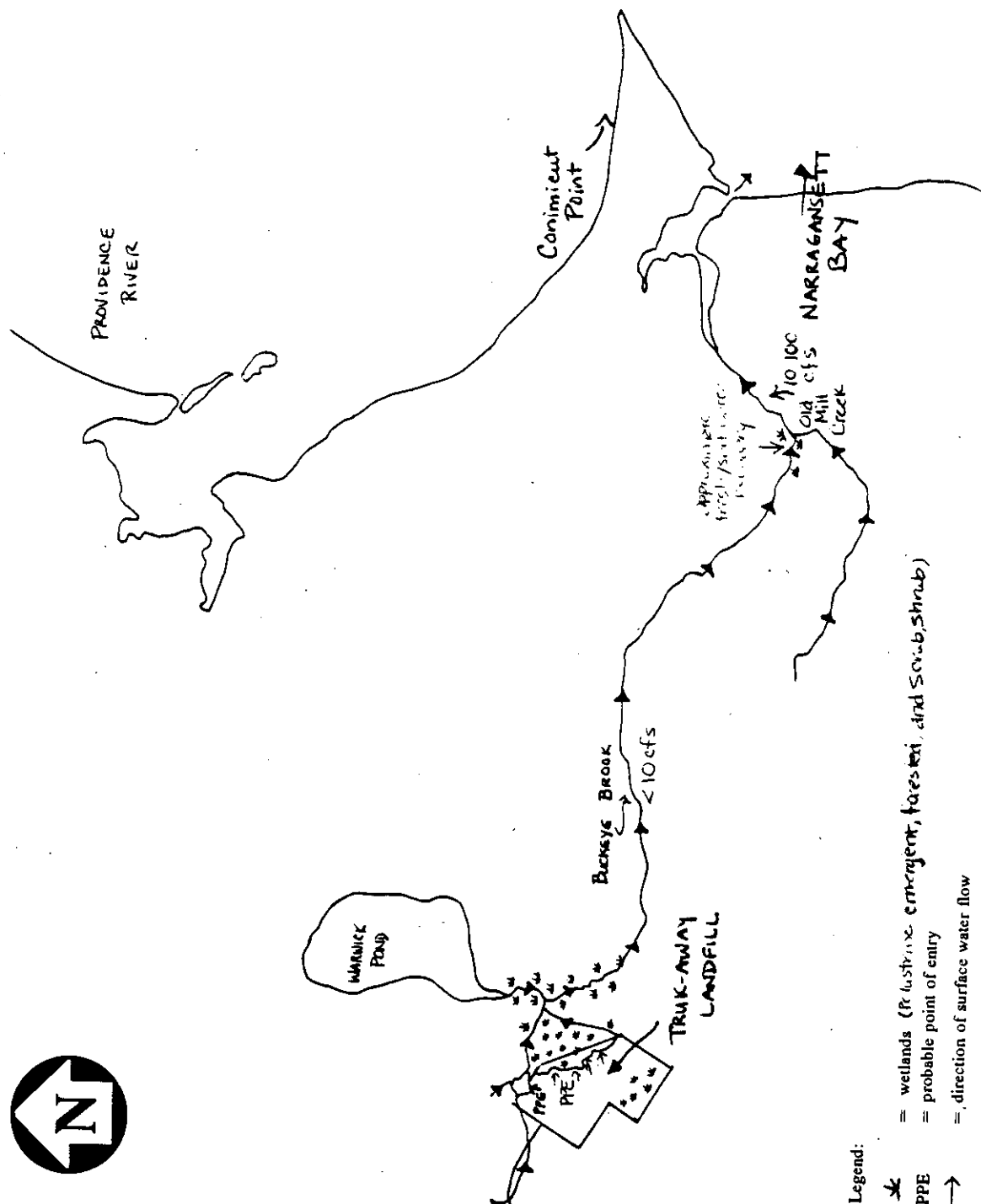
(Maximum of 100)

$$\frac{500 \times 3.3 \times 32}{82,500}$$

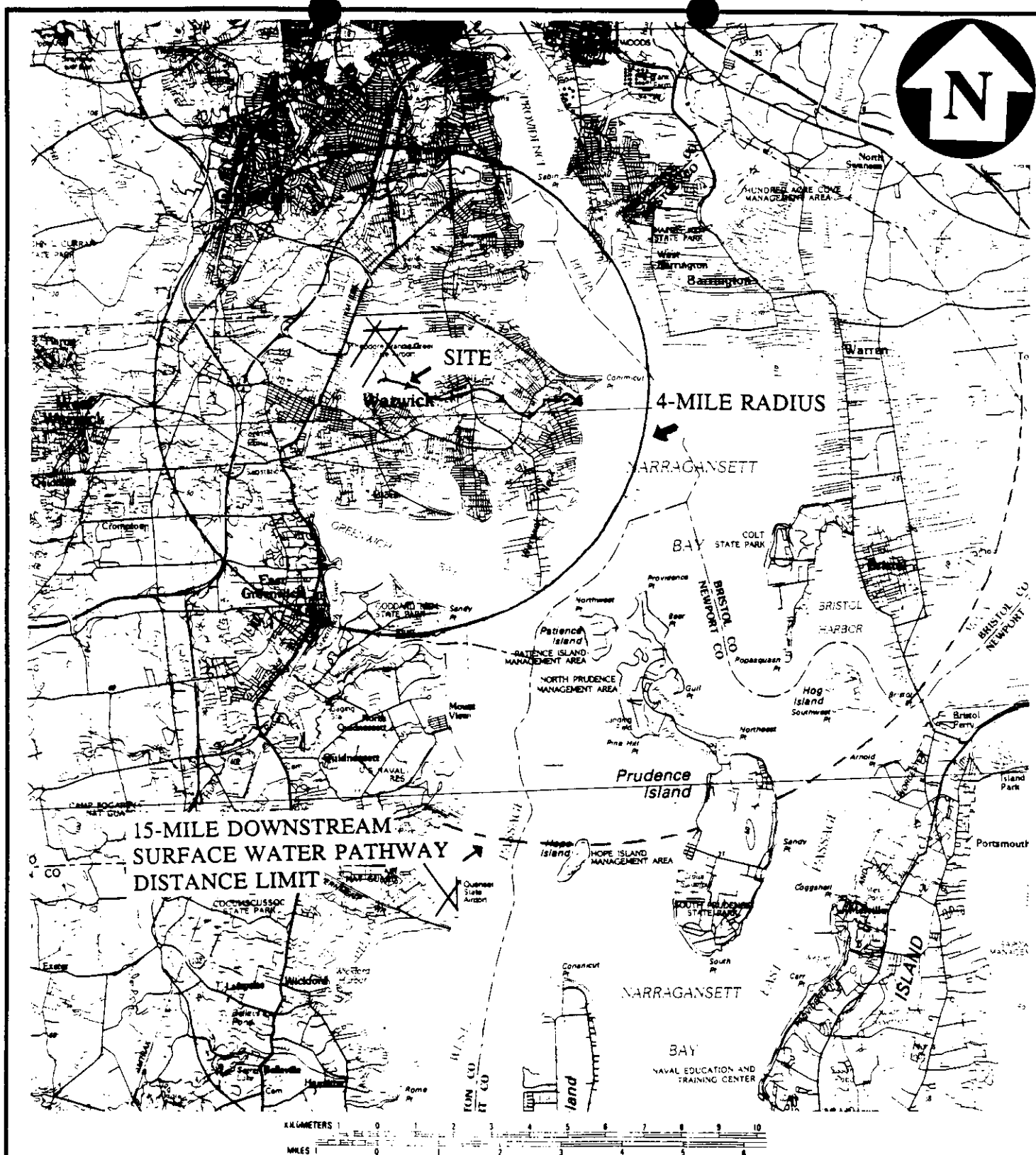
SURFACE WATER PATHWAY

Sketch of the Surface Water Migration Route:

Label all surface water bodies. Include runoff route and drainage direction, probable point of entry, and 15-mile target distance limit. Mark sample locations, intakes, fisheries, and sensitive environments. Indicate flow directions, tidal influence, and rate.



Buckeye Brook flows approximately 2.25 miles downstream where it joins Old Mill Creek and then flows 1 mile before reaching Narragansett Bay. The target distance limit includes 11.75 miles of the bay. As defined by RIDEM, the fresh and salt water boundary for Buckeye Brook is located at the West Shore Road (Route 117) Bridge in Warwick, just upstream of Old Mill Creek [11,31,32]. The flow rates for Buckeye Brook, Old Mill Creek, and Narragansett Bay are estimated based on visual observation and proximity to the ocean. No measurements have been taken [11,31,32].



Source: U.S.G.S. 1984. Providence Quadrangle, R.I., MA, and CT. 30' x 60' series (topographic).

4-MILE RADIUS TRUK-AWAY LANDFILL WARWICK, RHODE ISLAND



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Figure 4

SURFACE WATER PATHWAY LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET

LIKELIHOOD OF RELEASE- OVERLAND/FLOOD MIGRATION

	Score	Data Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7.	550	H	3, 27, 28
2. POTENTIAL TO RELEASE: Distance to surface water: <u>10</u> (feet) If sampling data do not support a release to surface water in the watershed, use the table below to assign a score from the table below based on distance to surface water and flood frequency.		E	3

Distance to surface water <2500 feet	500
Distance to surface water >2500 feet, and:	
Site in annual or 10-yr floodplain	500
Site in 100-yr floodplain	400
Site in 500-yr floodplain	300
Site outside 500-yr floodplain	100

Optionally, evaluate surface water potential to release according to HRS Section 4.1.2.1.2

LR = 550

LIKELIHOOD OF RELEASE GROUND WATER TO SURFACE WATER MIGRATION

	Score	Data Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7.	550	H	3, 27, 28
<p>NOTE: Evaluate ground water to surface water migration only for a surface water body that meets all of the following conditions:</p> <ol style="list-style-type: none"> 1) A portion of the surface water is within 1 mile of site sources having a containment factor greater than 0. 2) No aquifer discontinuity is established between the source and the above portion of the surface water body. 3) The top of the uppermost aquifer is at or above the bottom of the surface water. <p>Elevation of top of uppermost aquifer _____</p> <p>Elevation of bottom of surface water body _____</p>			
2. POTENTIAL TO RELEASE: Use the ground water potential to release. Optionally, evaluate surface water potential to release according to HRS Section 3.1.2.			

LR = 550

Note: Distance to surface water is estimated at 10 feet. The actual edge of the disposal of wastes at the landfill is unknown; however, the brook runs along the Truck-Away Landfill property.

Sample ID	Hazardous Substance	Bckgrd. Conc.	Toxicity/ Persistence	Tox./Pers./ Bioacc.	Ecotox./Pers./ Ecobioacc.	References
SD-01, SD-03	Pyrene	460 ug/kg	1.00E+02	5.00E+03	NA	3,27,28
SD-03	4,4'-DDE	4.6 ug/kg	1.00E+02	5.00E+06	5.00E+08	3,27,28
SD-01,SD-03	PCBs (Aroclor 1260)	46 ug/kg	1.00E+04	5.00E+08	5.00E+08	3,27,28
SD-03	Arsenic	1.7 ug/kg	1.00E+04	5.00E+06	5.00E+02	3,27,28
SD-01,SD-03	Bis(2-ethylhexyl)phthalate	460 ug/kg	1.00E+02	5.00E+04	5.00E+07	3,27,28
SD-03	Lead	5 mg/kg	1.00E+04	5.00E+07	5.00E+06	3,27,28
SD-03	Mercury	0.06 mg/kg	1.00E+04	5.00E+08	5.00E+08	3,27,28
SD-02	Benz(a)anthracene	460 ug/kg	1.00E+03	5.00E+07	5.00E+08	3,27,28
SD-02	Benzo(j,k)fluorene	460 ug/kg	1.00E+02	5.00E+06	5.00E+07	3,27,28
SD-02	Iron	5140 mg/kg	NA	NA	5.00	3,27,28
		Highest Values	1.00E+04	5.00E+08	5.00E+08	

SI Table 8: SURFACE WATER DRINKING WATER CONTAMINATION TARGETS

Intake ID	Sample Type	Level I	Level II		Population Served		References	
			Benchmark					
Sample ID	Hazardous Substance	Conc. (ug/L)	Conc. (MCL or MCLG)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD

SURFACE WATER PATHWAY LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET (CONTINUED)

DRINKING WATER THREAT TARGETS	Score	Data Type	Refs																
<p>Record the water body type, flow, and number of people served by each drinking water intake within the target distance limit in the watershed. If there is no drinking water intake within the target distance limit, assign 0 to factors 3, 4, and 5.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th style="text-align: left; padding: 2px;">Intake Name</th> <th style="text-align: left; padding: 2px;">Water Body Type</th> <th style="text-align: left; padding: 2px;">Flow</th> <th style="text-align: left; padding: 2px;">People Served</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> <p>Are any intakes part of a blended system? Yes _____ No _____ If yes, attach a page to show apportionment calculations.</p> <p>3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates a drinking water intake has been exposed to a hazardous substance from the site, list the intake name and evaluate the factor score for the drinking water population (SI Table 8).</p> <p>_____</p> <p>Level I: _____ people x 10 = _____ Level II: _____ people x 1 = _____ Total =</p>	Intake Name	Water Body Type	Flow	People Served													0	H	32
Intake Name	Water Body Type	Flow	People Served																
<p>4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water intakes for the watershed that have not been exposed to a hazardous substance from the site. Assign the population values from SI Table 9. Sum the values and multiply by 0.1.</p>	0	H	23, 32																
<p>5. NEAREST INTAKE: Assign a score of 50 for any Level I Actual Contamination Drinking Water Targets for the watershed. Assign a score of 45 if there are Level II targets for the watershed, but no Level I targets. If no Actual Contamination Drinking Water Targets exist, assign a score for the intake nearest the PPE from SI Table 9. If no drinking water intakes exist, assign 0.</p>	0	H	32, 33																
<p>6. RESOURCES: Assign a score of 5 if one or more surface water resource applies; assign 0 if none applies.</p> <ul style="list-style-type: none"> • Irrigation (5 acre minimum) of commercial food crops or commercial forage crops • Watering of commercial livestock • Ingredient in commercial food preparation • Major or designated water recreation area, excluding drinking water use (Narragansett Bay) 	5	H	32, 33																
SUM OF TARGETS T=	5																		

SI TABLE 9 (From HRS Table 4-14): DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY

Type of Surface Water Body	Pop.	Nearest Intake	Number of people									Pop. Value
			0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	
Minimal Stream (<10 cfs)		20	0	4	17	53	164	522	1,633	5,214	16,325	
Small to moderate stream (10 to 100 cfs)		2	0	0.4	2	5	16	52	163	521	1,633	
Moderate to large stream (> 100 to 1,000 cfs)		0	0	0.04	0.2	0.5	2	5	16	52	163	
Large Stream to river (>1,000 to 10,000 cfs)		0	0	0.004	0.02	0.05	0.2	0.5	2	5	16	
Large River (> 10,000 to 100,000 cfs)		0	0	0	0.002	0.005	0.02	0.05	0.2	0.5	16	
Very Large River (>100,000 cfs)		0	0	0	0	0.001	0.002	0.005	0.02	0.05	0.2	
Shallow ocean zone or Great Lake (depth < 20 feet)		0	0	0	0.002	0.005	0.02	0.05	0.2	0.5	2	
Moderate ocean zone or Great Lake (Depth 20 to 200 feet)		0	0	0	0	0.001	0.002	0.005	0.02	0.05	0.2	
Deep ocean zone or Great Lake (depth > 200 feet)		0	0	0	0	0	0.001	0.003	0.008	0.09	0.08	
3-mile mixing zone in quiet flowing river (≥ 10 cfs)		10	0	2	9	26	82	261	817	2,607	8,163	
Nearest Intake =			Sum =									

References _____

SI Table 10: HUMAN FOOD CHAIN ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Fishery ID	Sample Type	Level I	Level II	References				
Sample ID	Hazardous Substance	Conc. (mg/kg)	Benchmark Conc. (FDAAL)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
Highest Percent					Sum of Percents		Sum of Percents	

Notes: Benzo(j,k)fluorene = fluoranthene
Reference Sample: SD-06

SI Table 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Environment ID Buckeye Brook wetlands Sample Type sediment Level II Environment Value 25

Sample ID	Hazardous Substance	Conc. (ug/kg)	Benchmark Conc. (ug/L) (AWQC or AALAC)	% of Benchmark	References
SD-02	Benz(a)anthracene	600	NA	NA	27,28
	Benzo(j,k)fluorene	930	NA	NA	27,28
	Iron	67.8	1000	NA	27,28
	Pyrene	950	NA	NA	27,28
Highest Percent				NA	

Note: Sensitive environment Level II actual contamination targets are based on sediment samples; however, benchmark concentrations (AWQC or AALAC) refer to aqueous samples.
NA = Not available.

SURFACE WATER PATHWAY (continued) HUMAN FOOD CHAIN THREAT WORKSHEET

HUMAN FOOD CHAIN THREAT TARGETS

Record the water body type and flow for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a score of 0 at the bottom of this page.

Fishery Name	Buckeye Brook	Water Body	river	Flow	<10 cfs
Species	herring	Production	unknown	lbs/yr	
Species		Production		lbs/yr	
Fishery Name	Old Mill Creek	Water Body	river	Flow	10-100 cfs
Species	herring	Production	unknown	lbs/yr	
Species		Production		lbs/yr	
Fishery Name	Narragansett Bay	Water Body	coastal tidal waters	Flow	N/A cfs
Species	shellfish	Production	17,826,000	lbs/yr	
Species		Production		lbs/yr	

FOOD CHAIN INDIVIDUAL

7. ACTUAL CONTAMINATION FISHERIES:

If analytical evidence indicates that a fishery has been exposed to a hazardous substance with a bioaccumulation factor greater than or equal to 500 (SI Table 10), assign a score of 50 if there is a Level I fishery. Assign 45 if there is a Level II fishery, but no Level I fishery.

8. POTENTIAL CONTAMINATION FISHERIES:*

If there is a release of a substance with a bioaccumulation factor greater than or equal to 500 to a watershed containing fisheries within the target distance limit, but there are no Level I or Level II fisheries, assign a score of 20.

If there is no observed release to the watershed, assign a value for potential contamination fisheries from the table below using the lowest flow at all fisheries within the target distance limit:

Lowest Flow	FCI Value
<10 cfs	(20)
10 to 100 cfs	2
>100 cfs, coastal tidal waters, oceans, or Great Lakes	0
3-mile mixing zone in quiet flowing river	10

FCI Value =

SUM OF TARGETS T =

Score Data Type Refs

E 18, 32, 33

E 18, 32, 33

H 24

N/A

20 H 27, 28

N/A

20

* Contaminants w/ a bioaccumulation factor greater than 500 include:

Arsenic mercury DDE
Lead PCBs Bis(2-ethylhexyl)phthalate

N/A = Not applicable

SURFACE WATER PATHWAY (continued) ENVIRONMENTAL THREAT WORKSHEET

When measuring length of wetlands that are located on both sides of a surface water body, sum both frontage lengths. For a sensitive environment that is more than one type, assign a value for each type.

ENVIRONMENTAL THREAT TARGETS				Score	Data Type	Refs																																			
Record the water body type and flow for each surface water sensitive environment within the target distance (see SI Table 12). If there is no sensitive environment within the target distance limit, assign a score of 0 at the bottom of the page.																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Environment Name</th> <th style="width: 30%;">Water Body Type</th> <th style="width: 20%;">Flow</th> <th style="width: 20%;"></th> </tr> </thead> <tbody> <tr> <td>Buckeye Brook Wetlands</td> <td>river (Buckeye Brook)</td> <td><10 cfs</td> <td></td> </tr> <tr> <td>Spawning brook</td> <td>river (Buckeye Brook)</td> <td><10 cfs</td> <td></td> </tr> <tr> <td>Prudence Island WMA</td> <td>coastal tidal</td> <td>N/A cfs</td> <td></td> </tr> <tr> <td>Potter Island WMA</td> <td>coastal tidal</td> <td>N/A cfs</td> <td></td> </tr> <tr> <td>Narragansett Bay Reserve</td> <td>coastal tidal</td> <td>N/A cfs</td> <td></td> </tr> </tbody> </table>				Environment Name	Water Body Type	Flow		Buckeye Brook Wetlands	river (Buckeye Brook)	<10 cfs		Spawning brook	river (Buckeye Brook)	<10 cfs		Prudence Island WMA	coastal tidal	N/A cfs		Potter Island WMA	coastal tidal	N/A cfs		Narragansett Bay Reserve	coastal tidal	N/A cfs			E E E E E	30, 31, 32											
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Narragansett Bay Reserve	coastal tidal	N/A cfs																																							
9. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: If sampling data or direct observation indicate any sensitive environment has been exposed to a hazardous substance from the site, record this information on SI Table 11, and assign a factor value for the environment (SI Tables 13 and 14).																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Environment Name</th> <th style="width: 25%;">Environment Type and Value (SI Tables 13 & 14)</th> <th style="width: 20%;">Multiplier (10 for Level I, 1 for Level II)</th> <th style="width: 30%;">Product</th> </tr> </thead> <tbody> <tr> <td>Buckeye Brook emergent wetlands</td> <td>Wetlands 25</td> <td>x 1</td> <td>25</td> </tr> <tr> <td>Scrub shrub and forested wetlands</td> <td></td> <td>x</td> <td></td> </tr> <tr> <td></td> <td></td> <td>x</td> <td></td> </tr> <tr> <td></td> <td></td> <td>x</td> <td></td> </tr> <tr> <td colspan="3" style="text-align: right;">Sum =</td> <td>25</td> </tr> </tbody> </table>				Environment Name	Environment Type and Value (SI Tables 13 & 14)	Multiplier (10 for Level I, 1 for Level II)	Product	Buckeye Brook emergent wetlands	Wetlands 25	x 1	25	Scrub shrub and forested wetlands		x				x				x		Sum =			25		H	26, 34											
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Sum =			25																																						
10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS:																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Flow</th> <th style="width: 15%;">Dilution Weight (SI Table 12)</th> <th style="width: 20%;">Environment Type and Value (SI Tables 13 & 14)</th> <th style="width: 10%;">Pot. Cont.</th> <th style="width: 45%;">Product</th> </tr> </thead> <tbody> <tr> <td><10 cfs</td> <td>1</td> <td>Spawning Area 75</td> <td>x 0.1 =</td> <td>7.5</td> </tr> <tr> <td>N/A cfs</td> <td>0.0001</td> <td>Wildlife Mgmt Areas (25 x 3)</td> <td>x 0.1 =</td> <td>0.00075</td> </tr> <tr> <td>N/A cfs</td> <td>0.0001</td> <td>Narragansett Bay Reserve 100</td> <td>x 0.1 =</td> <td>0.001</td> </tr> <tr> <td>cfs</td> <td></td> <td></td> <td>x 0.1 =</td> <td></td> </tr> <tr> <td>cfs</td> <td></td> <td></td> <td>x 0.1 =</td> <td></td> </tr> <tr> <td colspan="4" style="text-align: right;">Sum =</td> <td>7.5</td> </tr> </tbody> </table>				Flow	Dilution Weight (SI Table 12)	Environment Type and Value (SI Tables 13 & 14)	Pot. Cont.	Product	<10 cfs	1	Spawning Area 75	x 0.1 =	7.5	N/A cfs	0.0001	Wildlife Mgmt Areas (25 x 3)	x 0.1 =	0.00075	N/A cfs	0.0001	Narragansett Bay Reserve 100	x 0.1 =	0.001	cfs			x 0.1 =		cfs			x 0.1 =		Sum =				7.5		H H H	23, 25, 28, 29, 35
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cfs			x 0.1 =																																						
cfs			x 0.1 =																																						
Sum =				7.5																																					
T =				32.5																																					

Note: The exact linear distance of actual contamination wetlands is not documented. However, due to the large waste characteristics score the pathway will score a 50 on potential environmental threat alone.

N/A - Not applicable

SURFACE WATER PATHWAY (concluded)
WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

WASTE CHARACTERISTICS

Score

11. If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, assign the calculated hazardous waste quantity score , or a score of 100, whichever is greater.	100
12. Assign the highest value from SI Table 7 (observed release) or SI Table 3 (no observed release) for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat.	WC Score (from Table) (Maximum of 100 for drinking water threat; Maximum of 1000 for human foodchain and environmental threat.)

	Substance Value	HWQ	Product	
Drinking Water Threat Toxicity/Persistence	$10,000 \left(\frac{Pb, Hg}{PCBs} \right) \times$	100	1×10^4	32
Food Chain Threat Toxicity/Persistence Bioaccumulation	$5 \times 10^5 \left(\frac{Hg}{PCBs} \right) \times$	100	5×10^{10}	320
Environmental Threat Ecotoxicity/Persistence/ Ecobioaccumulation	$5 \times 10^5 \left(\frac{DDE, Hg}{PCBs} \right) \times$	100	5×10^{10}	320

Product	WC Score
0	0
>0 to <10	1
10 to <100	2
100 to <1,000	3
1,000 to < 10,000	6
10,000 to <1E + 05	10
1E + 05 to <1E + 06	18
1E + 06 to <1E + 07	32
1E + 07 to <1E + 08	58
1E + 08 to <1E + 09	100
1E + 09 to <1E + 10	180
1E + 10 to <1E + 11	320
1E + 11 to <1E + 12	560
1E + 12 or greater	1000

SURFACE WATER PATHWAY THREAT SCORES

Threat	Likelihood of Release (LR) Score	Targets (T) Score	Pathway Waste Characteristics (WC) Score (determined above)	Threat Score $LR \times T \times WC$ 82,500
Drinking Water	550	5	32	(maximum of 100) 1.07
Human Food Chain	550	20	320	(maximum of 100) 42.67
Environmental	550	32.5	320	(maximum of 60) 60

SURFACE WATER PATHWAY SCORE
 (Drinking Water Threat + Human Food Chain Threat + Environmental Threat)

(maximum of 100)

100

SI TABLE 15: SOIL EXPOSURE RESIDENT POPULATION TARGETS

Residence ID: _____ Level I _____ Level II _____ Population _____

Sample ID	Hazardous Substance	Conc. (mg/kg)	Cancer Risk Concentration	% of Cancer Risk Conc.	RfD	% of RfD	Toxicity Value	References
			Highest Percent		Sum of Percents		Sum of Percents	

Residence ID: _____ Level I _____ Level II _____ Population _____

Sample ID	Hazardous Substance	Conc. (mg/kg)	Cancer Risk Concentration	% of Cancer Risk Conc.	RfD	% of RfD	Toxicity Value	References
			Highest Percent		Sum of Percents		Sum of Percents	

Residence ID: _____ Level I _____ Level II _____ Population _____

Sample ID	Hazardous Substance	Conc. (mg/kg)	Cancer Risk Concentration	% of Cancer Risk Conc.	RfD	% of RfD	Toxicity Value	References
			Highest Percent		Sum of Percents		Sum of Percents	

SOIL EXPOSURE PATHWAY WORKSHEET RESIDENT POPULATION THREAT

LIKELIHOOD OF EXPOSURE

	Score	Data Type	Rets
1. OBSERVED CONTAMINATION: If evidence indicates presence of observed contamination (depth of 2 feet or less), assign a score of 550; otherwise, assign a 0. Note that a likelihood of exposure score of 0 results in a soil exposure pathway score of 0.	550	H	27, 28

LE = 550

TARGETS

<p>2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or day care on or within 200 feet of areas of observed contamination (HRS section 5.1.3).</p> <p>Level I: _____ people x 10 = _____</p> <p>Level II: _____ people x 1 = _____</p> <p>Sum =</p>	0	H	3, 32										
<p>3. RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exists (i.e., no Level I or Level II targets), assign 0 (HRS Section 5.1.3).</p>	0	H	3, 32										
<p>4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities with areas of observed contamination associated with the site.</p> <table border="1"> <thead> <tr> <th>Number of Workers</th> <th>Score</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> </tr> <tr> <td>1 to 100</td> <td>5</td> </tr> <tr> <td>101 to 1,000</td> <td>10</td> </tr> <tr> <td>>1,000</td> <td>15</td> </tr> </tbody> </table>	Number of Workers	Score	0	0	1 to 100	5	101 to 1,000	10	>1,000	15	5	E	3, 19
Number of Workers	Score												
0	0												
1 to 100	5												
101 to 1,000	10												
>1,000	15												
<p>5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for each terrestrial sensitive environment (SI Table 16) in an area of observed contamination.</p> <table border="1"> <thead> <tr> <th>Terrestrial Sensitive Environment Type</th> <th>Value</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table> <p>Sum =</p>	Terrestrial Sensitive Environment Type	Value									0	E	35
Terrestrial Sensitive Environment Type	Value												
<p>6. RESOURCES: Assign a score of 5 if any one or more of the following resources is present on an area of observed contamination at the site; assign 0 if none applies.</p> <ul style="list-style-type: none"> • Commercial agriculture • Commercial silviculture • Commercial livestock production or commercial livestock grazing 	0	H	3										

Total of Targets T= 5

SOIL EXPOSURE PATHWAY WORKSHEET NEARBY POPULATION THREAT

LIKELIHOOD OF EXPOSURE		Score	Data Type	Ref.
7. Attractiveness/Accessibility (from SI Table 17 or HRS Table 5-6)	Value <u>75</u>		H	3
Area of Contamination (from SI Table 18 or HRS Table 5-7)	Value <u>100</u>		E	3, 10
Landfill 1,568,100 ft ²		Likelihood of Exposure (from SI Table 19 or HRS Table 5-8)	500	
LE =		500		

TARGETS		Score	Data Type	Ref.
8. Assign a score of 0 if Level I or Level II resident individual has been evaluated or if no individuals live within 1/4 mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within 1/4 mile travel distance and no Level I or Level II resident population has been evaluated.		1	H	3, 32
9. Determine the population within 1 mile travel distance that is not exposed to a hazardous substance from the site (i.e., properties that are not determined to be Level I or Level II); record the population for each distance category in SI Table 20 (HRS Table 5-10). Sum the population values and multiply by 0.1.		1.04	E	6, 16, 17, 21
T =		2.04		

SI TABLE 19 (HRS TABLE 5-8): NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

AREA OF CONTAMINATION FACTOR VALUE	ATTRACTIVENESS/ACCESSIBILITY FACTOR VALUE						
	100	75	50	25	10	5	0
100	500	500	375	250	125	50	0
80	500	375	250	125	50	25	0
60	375	250	125	50	25	5	0
40	250	125	50	25	5	5	0
20	125	50	25	5	5	5	0
5	50	25	5	5	5	5	0

SI TABLE 20 (HRS TABLE 5-10): DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT

Travel Distance Category (miles)	Pop.	Number of people within the travel distance category												Pop. Value
		0	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,001	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	
Greater than 0 to $\frac{1}{4}$	17	0	0.1	0.4	1.0	4	13	41	130	408	1,303	4,081	13,034	0.4
Greater than $\frac{1}{4}$ to $\frac{1}{2}$	459	0	0.05	0.2	0.7	2	7	20	65	204	652	2,041	6,517	7
Greater than $\frac{1}{2}$ to 1	848	0	0.02	0.1	0.3	1	3	10	33	102	326	1,020	3,258	3
Reference(s) 6, 16, 17, 21														Sum = 10.4

SOIL EXPOSURE PATHWAY WORKSHEET (concluded)

WASTE CHARACTERISTICS

10. Assign the hazardous waste quantity score calculated for soil exposure <i>Entire landfill used due to insufficient cover, exposed waste, and analytical results.</i>	100																						
11. Assign the highest toxicity value from SI Table 1615 or Table 3 <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: left;"> <i>Arsenic } 10,000</i> <i>Chromium } 10,000</i> <i>Lead } 10,000</i> </div> <div style="text-align: left;"> <i>mercury } 10,000</i> <i>PCBs } 10,000</i> </div> </div>	10,000																						
12. Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: <table border="1" style="margin: 10px auto; border-collapse: collapse; font-size: 0.8em;"> <thead> <tr> <th style="padding: 2px;">Product</th> <th style="padding: 2px;">WC Score</th> </tr> </thead> <tbody> <tr><td style="padding: 2px;">0</td><td style="padding: 2px;">0</td></tr> <tr><td style="padding: 2px;">>0 to <10</td><td style="padding: 2px;">1</td></tr> <tr><td style="padding: 2px;">10 to <100</td><td style="padding: 2px;">2</td></tr> <tr><td style="padding: 2px;">100 to <1,000</td><td style="padding: 2px;">3</td></tr> <tr><td style="padding: 2px;">1,000 to < 10,000</td><td style="padding: 2px;">6</td></tr> <tr><td style="padding: 2px;">10,000 to <1E + 05</td><td style="padding: 2px;">10</td></tr> <tr><td style="padding: 2px;">1E + 05 to <1E + 06</td><td style="padding: 2px;">18</td></tr> <tr><td style="padding: 2px;">1E + 06 to <1E + 07</td><td style="padding: 2px;">32</td></tr> <tr><td style="padding: 2px;">1E + 07 to <1E + 08</td><td style="padding: 2px;">56</td></tr> <tr><td style="padding: 2px;">1E + 08 or greater</td><td style="padding: 2px;">100</td></tr> </tbody> </table>	Product	WC Score	0	0	>0 to <10	1	10 to <100	2	100 to <1,000	3	1,000 to < 10,000	6	10,000 to <1E + 05	10	1E + 05 to <1E + 06	18	1E + 06 to <1E + 07	32	1E + 07 to <1E + 08	56	1E + 08 or greater	100	WC = 32
Product	WC Score																						
0	0																						
>0 to <10	1																						
10 to <100	2																						
100 to <1,000	3																						
1,000 to < 10,000	6																						
10,000 to <1E + 05	10																						
1E + 05 to <1E + 06	18																						
1E + 06 to <1E + 07	32																						
1E + 07 to <1E + 08	56																						
1E + 08 or greater	100																						

RESIDENT POPULATION THREAT SCORE:

(Likelihood of Exposure, Question 1;
Targets = Sum of Questions 2, 3, 4, 5, 6)

$$\frac{550 \times 5 \times 32}{82,500}$$

$$\frac{LE \times T \times WC}{82,500}$$

1.07

NEARBY POPULATION THREAT SCORE:

(Likelihood of Exposure, Question 7;
Targets = Sum of Questions 8, 9)

$$\frac{500 \times 2.04 \times 32}{82,500}$$

$$\frac{LE \times T \times WC}{82,500}$$

0.4

SOIL EXPOSURE PATHWAY SCORE:

Resident Population Threat + Nearby Population Threat

1.47

(Maximum of 100)

SI TABLE 21: AIR PATHWAY OBSERVED RELEASE SUBSTANCES

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) _____ References _____

Hazardous Substance	Conc. ($\mu\text{g}/\text{m}^3$)	Gaseous Particulate	Benchmark Conc. (NAAQS or NESHAPS)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
Highest Toxicity/Mobility			Highest Percent		Sum of Percents		Sum of Percents	

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) _____ References _____

Hazardous Substance	Conc. ($\mu\text{g}/\text{m}^3$)	Toxicity/Mobility	Benchmark Conc. (NAAQS or NESHAPS)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
Highest Toxicity/Mobility			Highest Percent		Sum of Percents		Sum of Percents	

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) _____ References _____

Hazardous Substance	Conc. ($\mu\text{g}/\text{m}^3$)	Toxicity/Mobility	Benchmark Conc. (NAAQS or NESHAPS)	% of Benchmark	Cancer Risk Conc.	% of Cancer Risk Conc.	RfD	% of RfD
Highest Toxicity/Mobility			Highest Percent		Sum of Percents		Sum of Percents	

SI TABLE 22 (From HRS TABLE 6-17): VALUES FOR POTENTIAL CONTAMINATION AIR TARGET POPULATIONS

Distance from Site	Pop.	Nearest Individual (choose highest)	Number of People within the Distance Category												Pop. Value
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	1,000,000 to 3,000,000	
On a source	0	20	4	17	53	164	522	1,633	5,214	16,325	52,137	163,246	521,360	1,632,455	0
0 to $\frac{1}{4}$ mile	37	*	1	4	13	41	131	408	1,304	4,081	13,034	40,812	130,340	408,114	13
$>\frac{1}{4}$ to $\frac{1}{2}$ mile	689	2	0.2	0.9	3	9	28	88	282	882	2,815	8,815	28,153	88,153	28
$>\frac{1}{2}$ to 1 mile	848	1	0.06	0.3	0.9	3	8	26	83	261	834	2,612	8,342	26,119	8
>1 to 2 miles	3,189	0	0.02	0.09	0.3	0.8	3	8	27	83	266	833	2,659	8,326	27
>2 to 3 miles	6,450	0	0.009	0.04	0.1	0.4	1	4	12	38	120	375	1,199	3,755	12
>3 to 4 miles	8,393	0	0.005	0.02	0.07	0.2	0.7	2	7	28	73	229	730	2,285	7
Nearest Individual =		20	$95 \times 0.1 = 9.5$												Sum = 95

References 6, 16, 17, 19, 21

* Score = 20 if the Nearest Individual is within $\frac{1}{8}$ mile of a source; score = 7 if the Nearest Individual is between $\frac{1}{8}$ and $\frac{1}{4}$ mile of a source.

Air Target Populations: The nearest individual score of 20 is based on the workers at the office park on the former Leesona Corporation property located adjacent to the landfill. Included in the population figures are an estimated 20 people at the office park adjacent to the property (0 to $\frac{1}{4}$ mile), 230 employees at Jay Printing Corporation ($>\frac{1}{4}$ to $\frac{1}{2}$ mile), 383 Lippett School students ($>\frac{1}{4}$ to $\frac{1}{2}$ mile), and 240 Buttonwoods School students ($>\frac{1}{2}$ to 1 mile). Any additional students or workers would increase the potential air target population.

AIR PATHWAY WORKSHEET

LIKELIHOOD OF RELEASE	Score	Data Type	Refs
1. OBSERVED RELEASE: If sampling data or direct observation support a release to air, assign a score of 550. Record observed release substances on SI Table 21.	—		
2. POTENTIAL TO RELEASE: If sampling data do not support a release to air, assign a score of 500. Optionally, evaluate air migration gaseous and particulate potential to release (HRS Section 6.1.2).	500	E	3
LR =		500	

TARGETS	Score	Data Type	Refs																																		
3. ACTUAL CONTAMINATION POPULATION: Determine the number of people within the target distance limit subject to exposure from a release of a hazardous substance to the air. a) Level I: _____ people x 10 = _____ b) Level II: _____ people x 1 = _____ Total = _____	0	E	3																																		
4. POTENTIAL TARGET POPULATION: Determine the number of people within the target distance limit not subject to exposure from a release of a hazardous substance to the air, and assign the total population score from SI Table 22. Sum the values and multiply the sum by 0.1.	9.5	E	6, 10, 17, 19, 21																																		
5. NEAREST INDIVIDUAL: Assign a score of 50 if there are any Level I targets. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Population exists, assign the Nearest Individual score from SI Table 22.	20	H	3, 26																																		
6. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (SI Table 13) and wetland acreage values (SI Table 23) for environments subject to exposure from the release of a hazardous substance to the air. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Sensitive Environment Type</th> <th style="text-align: center;">Value</th> </tr> </thead> <tbody> <tr><td> </td><td style="text-align: center;"> </td></tr> <tr><td> </td><td style="text-align: center;"> </td></tr> <tr><td> </td><td style="text-align: center;"> </td></tr> <tr><td> </td><td style="text-align: center;"> </td></tr> <tr><td> </td><td style="text-align: center;"> </td></tr> <tr><td> </td><td style="text-align: center;"> </td></tr> <tr><td> </td><td style="text-align: center;"> </td></tr> <tr><td> </td><td style="text-align: center;"> </td></tr> <tr><td> </td><td style="text-align: center;"> </td></tr> <tr><td> </td><td style="text-align: center;"> </td></tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Wetland Acreage</th> <th style="text-align: center;">Value</th> </tr> </thead> <tbody> <tr><td>Palustrine, emergent, forested</td><td style="text-align: center;">75</td></tr> <tr><td>Grass, scrub, shrub</td><td style="text-align: center;"> </td></tr> <tr><td> </td><td style="text-align: center;"> </td></tr> <tr><td> </td><td style="text-align: center;"> </td></tr> <tr><td> </td><td style="text-align: center;"> </td></tr> </tbody> </table>	Sensitive Environment Type	Value																					Wetland Acreage	Value	Palustrine, emergent, forested	75	Grass, scrub, shrub								N/A		3, 34
Sensitive Environment Type	Value																																				
Wetland Acreage	Value																																				
Palustrine, emergent, forested	75																																				
Grass, scrub, shrub																																					
7. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS: Use SI Table 24 to evaluate sensitive environments not subject to exposure from a release.	3.75	H	35																																		
8. RESOURCES: Assign a score of 5 if one or more air resources apply within 1/2 mile of a source; assign a 0 if none applies. • Commercial agriculture • Commercial silviculture • Major or designated recreation area	5	H	26																																		
T =		38.25																																			

Wetland Acreage
 Based on National Wetland Inventory map (landfill area only)
 = 6.66 miles² × 640 acres = 51.2 acres
 1 miles²

SI TABLE 23 (HRS TABLE
6-18): AIR PATHWAY
VALUES FOR WETLAND
AREA

Wetland Area	Assigned Value
< 1 acre	0
1 to 50 acres	25
> 50 to 100 acres	75
> 100 to 150 acres	125
> 150 to 200 acres	175
> 200 to 300 acres	250
> 300 to 400 acres	350
> 400 to 500 acres	450
> 500 acres	500

SI TABLE 24: DISTANCE WEIGHTS AND
CALCULATIONS FOR AIR PATHWAY POTENTIAL
CONTAMINATION SENSITIVE ENVIRONMENTS

Distance	Distance Weight	Sensitive Environment Type and Value (from SI Tables 13 and 20)	Product
On a Source	0.10	x	
		x	
0 to 1/4 mile	0.025	x 75 (emergent wetlands)	1.875
		x 75 (spawning area)	1.875
		x	
1/4 to 1/2 mile	0.0054	x	
		x	
		x	
1/2 to 1 mile	0.0016	x	
		x	
		x	
1 to 2 miles	0.0005	x	
		x	
		x	
2 to 3 miles	0.00023	x	
		x	
		x	
3 to 4 miles	0.00014	x	
		x	
		x	
> 4 miles	0	x	
Total Environments Score =			3.75

AIR PATHWAY (concluded)

WASTE CHARACTERISTICS

<p>9. If any Actual Contamination Targets exist for the air pathway, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if there are no Actual Contamination Targets for the air pathway, assign the calculated HWQ score for sources available to air migration.</p>	100																						
<p>10. Assign the highest air toxicity/mobility value from SI Table 21. <i>PCBs = 10,000 Air tox mobility for PCBs = 1</i></p>	10,000																						
<p>11. Multiply the air pathway toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below:</p> <table border="1" style="margin: 10px auto; border-collapse: collapse; font-size: 0.8em;"> <thead> <tr> <th style="text-align: left; padding: 2px;">Product</th> <th style="text-align: left; padding: 2px;">WC Score</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td></tr> <tr><td>>0 to <10</td><td>1</td></tr> <tr><td>10 to <100</td><td>2</td></tr> <tr><td>100 to <1,000</td><td>3</td></tr> <tr><td>1,000 to <10,000</td><td>6</td></tr> <tr><td>10,000 to <1E + 05</td><td>10</td></tr> <tr><td>1E + 05 to <1E + 06</td><td>18</td></tr> <tr><td>1E + 06 to <1E + 07</td><td>32</td></tr> <tr><td>1E + 07 to <1E + 08</td><td>56</td></tr> <tr><td>1E + 08 or greater</td><td>100</td></tr> </tbody> </table>	Product	WC Score	0	0	>0 to <10	1	10 to <100	2	100 to <1,000	3	1,000 to <10,000	6	10,000 to <1E + 05	10	1E + 05 to <1E + 06	18	1E + 06 to <1E + 07	32	1E + 07 to <1E + 08	56	1E + 08 or greater	100	WC = 32
Product	WC Score																						
0	0																						
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1E + 06 to <1E + 07	32																						
1E + 07 to <1E + 08	56																						
1E + 08 or greater	100																						

AIR PATHWAY SCORE:

$$\frac{LE \times T \times WC}{82,500}$$

7.4

(maximum of 100)

$$\frac{500 \times 38 \times 32}{82,500}$$

SITE SCORE CALCULATION		
	S	S ²
GROUND WATER PATHWAY SCORE (S _{GW})	0.6	0.36
SURFACE WATER PATHWAY SCORE (S _{sw})	100	10,000
SOIL EXPOSURE (S _s)	1.5	2.25
AIR PATHWAY SCORE (S _A)	7.4	54.76
SITE SCORE $\sqrt{\frac{S_{GW}^2 + S_{sw}^2 + S_s^2 + S_A^2}{4}}$		50.1

COMMENTS

The overall score for the Truk-Away Landfill was calculated using an observed release to surface water and a bioaccumulation factor of greater than or equal to 500 (for arsenic (bis(2-ethylhexyl)phthalate, chromium, 4,4'-DDE, lead, mercury, and polychlorinated biphenyls (PCBs)) resulting in a potential human food chain threat for the surface water pathway score of 100⁴³. Each of the above contaminants have been detected in samples collected from the landfill and in samples collected from Buckeye Brook.

In addition, contamination associated with the landfill was detected in a sample collected on the northeastern edge of the landfill, in an area believed to be part of the designated wetlands. This sample indicated the presence of fluoranthene, pyrene, benz(a)anthracene, benzo(b)fluoranthene, and iron significantly greater than the reference sample. The presence of iron, benz(a)anthracene, benzo(j,k)fluorene, and pyrene in the wetland sediment sample indicates a Level II actual contamination target for the surface water pathway sensitive environment threat. (60)

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